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DATA PROCESSING DIGEST

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General Information

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EDP—THE MODERN MANAGEMENT CONTROL

Captain Charles Stein, U. S. Navy
ARMED FORCES MANAGEMENT, March 1957, pages 28-33

The Navy has charted the course for efficient planning and use of electronic business equipment and this article shows why.

"For management, data processing poses the problem of adapting to new concepts and new methods of operations that require a complete 'rethinking' of the purpose, as well as the organization, of entire functions." Electronic computers must be considered a means to an end, and not an end in themselves. Their capabilities must be matched with systems design ingenuity; and "it would be a waste of the machine's promise if we limited its application to our current system and achieved, not a major break-through, but only a speed-up."

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"Never before has there been the requirement for such a complete change of methods in such a wide area as is implicit in the electronic approach to data processing. This is a job for imaginative thinkers having the earnest support of top management. Departmental barriers may disappear and existing divisions, branches, and sections may be completely realigned. There will be many instances of resistance (some of them of a political nature) which must be ignored for the common good of the organization."

How does the Navy propose to make use of electronic data processing equipment? "The inventory control application ((for example)) is expected to develop new information of great value....It is entirely feasible that once a proposed program schedule is known, the computer can automatically determine the material requirements for every item of a required material for any selected period of time....Perhaps the most important result of this application will be that management should be able to analyze the effect of a proposed program on the inventory and financial situation....

Navy will predict inventory, analyze budgets

"With the help of the computer, we expect that our budgets will be more timely and realistic.... We expect to be able to prepare several budgets to pre-analyze the effect of alternative courses of action...we expect that the computer will become a very effective communication device...by its ability to make integrated analyses and reports which reflect the requirements and results of all management functions....Our long-range objective is the development of an integrated management control system."

What are the implications of this proposed system? 1) Management "will be able to pre-evaluate the effects of a fleet expansion forecast on the efficiency of the supply and fiscal functions..." 2) "Proposed program schedules will become more realistic..." 3) "Because of management's new ability to 'turn more nearly on a dime,' supply will be in a better position to capitalize on better and more efficient material support opportunities." 4) "Decisions will no longer tend to be independent" but will be based on "an objective, coordinated analysis."

The author predicts that "as price competition becomes more of a factor among electronic equipment manufacturers, we will probably see more units built with portable components so that unnecessary 'hardware' will be eliminated and only those building blocks distributed which are needed for the specific installation."

ADMINISTERING A CONVERSION TO ELECTRONIC ACCOUNTING

Harold Farlow Craig, Harvard University
Published by Division of Research, Graduate School of Business Administration, Harvard University, 1955.

This is an interesting case study of the administrative and personnel aspects of a conversion to machine methods. The fact that it is about a punch card installation does not lessen its value to those who are about to install electronic data processing equipment.

Too little has been written about the human factor in designing a new system. The irreducible minimum of any system is an amalgam of information and people. And information cannot exist without human initiation and manipulation. The case study was prepared "to provide the active administrator, the practitioner, with increased insight into complex human and organizational situations....guides toward the resolution of the new problems posed by technological change in the office ...and of...making necessary technical changes compatible with the traditions and routine required to secure cooperative activity in an organization."

The commercial insurance department of a large insurance company was the locale of the study, and it probes "the particular

administrative problems of introducing electronic office equipment into a large office that had traditionally handled its work primarily with manual methods. Secondly...it is a study of the administrative process of introducing a major technological change while at the same time maintaining some continuity within an established work group."

Liberal use is made of transcripts of conversation, between the author and executives, author and clerks, and among management and supervisory personnel in informal meetings. The way in which the commercial department devised new procedures, established the punched card installation, and gradually converted to the new methods without disturbing the morale or the traditional personnel practices and policies of the department is well described.

Administrative skill makes an efficient conversion

The success of the conversion, in the opinion of the author, was due to "administrative skill...in day-to-day behavior...an important element in the successful blending of the economic, technical, and human factors present in each situation." The author believes that "the administrator should not leave maintenance of the equilibrium of the social organization to chance. He should take positive steps to maintain the cohesion of the organization, and he should be careful to avoid making unnecessary or inadvertent changes which affect the social organization during the conversion period."

This case study should have an important place in the preliminary study of an organization embarking on a large-scale re-design of its business systems.

Price $2.50

ENGINEERING AND PAPERWORK CONTROL

Office Management Series #143, American Management Association, 1956.

Preliminary to the installation of an electronic data processing system are many hours of systems analysis and engineering. While precise systems analysis techniques have been devised for manufacturing processes, office procedures have seemed to defy exact and efficient measurement.

The series of articles in this pamphlet will give management and systems people some help in finding ways of analyzing office procedures. Of particular interest is the discussion of IPC--integrated procedures control. This is a system for analysis, measurement, and control of office work which uses the form as the beginning point of study in any one department. Line supervisors fill out a standard inquiry card on the purpose and physical description of the forms in their particular department. They also fill out similar inquiry cards regarding the communicative, repetitious, and end-point activities of their departments. These inquiry cards

IPC . . . a system for analysis of office work

are then coded by the systems department and the codes are punched into tab cards which can be processed to show any number of work patterns throughout the various departments. Here is an automatic data processing technique which can eliminate the voluminous and intricate flow charts, and makes use of sampling methods which are easily handled by the supervisors directly in charge of the procedures being analyzed. Time estimates of any one job or process can be obtained by manipulation of the data obtained. Similarly, the duties of any one person can be studied.

WORK SIMPLIFICATION

Ben S. Graham, Standard Register Company, Dayton, Ohio
Published by Standard Register Company.

Fuzzy thinking about what is actually happening in a business activity can throttle the best intentions of a computer-minded management. Therefore, it behooves those responsible for the feasibility study program to see that anyone in the organization who must participate in the systems analysis portion of the study understands the dynamics of a business process. This booklet should help.

Work Simplification is defined in the first chapter as "the organized application of common sense to find better and easier ways of doing a job...to eliminate waste of any kind...." Paperwork simplification adapts this concept to the problems of paperwork. The booklet covers the subjects of flow charts and diagrams, work measurement, form design, waste elimination, organizing and developing participation in a paperwork simplification program. For information about acquiring a copy of the booklet, write to The Standard Register Company, Dayton 1, Ohio.

AUTOMATION IN BUSINESS AND INDUSTRY

Edited by Eugene M. Grabbe, Ramo-Wooldridge Corp., Los Angeles
John Wiley & Sons, Inc., 1957.

Twenty-one men well-known in the computer field gave a series of lectures in the spring of 1955 as an extension course of the University of California at Los Angeles. These lectures have been compiled and edited into a book which covers the entire range of automation, from the business office to automatic flight control.

The weight is largely on the side of automation in the factory and servo applications such as chemical processing and aircraft control. Since DPD is primarily concerned with literature in the field of business data processing, the remainder of the review will be concerned with the EDP portion of the book.

The office and plant meet in data processing needs

In one of the introductory chapters (which include a general introduction to the theory and tools of automation, along with a glossary of terminology), the author states that "eventually we shall see the computers used for data-processing equipment being applied first to monitor and then actually to control the equipment used in the factory." Here is where the office and the plant meet in their data processing needs. Both this section on page 24 and the section beginning on page 224 are of value to the businessman in understanding the potentials of electronic equipment. Not only will the line between plant automation and office automation gradually disappear, but, as stated in the second referenced section above, the line between business and scientific problems will disappear. An example is given of the control of inventory, usually considered a problem of human judgment, caught in the no-mans-land between sales, production, and accounting functions. "It appears possible...to have the computer carry out a continuous re-evaluation of the system, properly adjusting the action it takes in maintaining the inventory on each item so that the capital tied up in inventory is minimized while at the same time the risks attendant upon too low an inventory position are controlled. Such an application for an electronic business machine certainly lies within the field of business operations, but any approach that attempts to do this in a rational way must at the same time lean heavily upon mathematical and scientific techniques."

About 132 pages of the book's 596 have a direct value to the businessman who is primarily concerned with the processing of business records. However, those who are curious about, or actively engaged in a program of plant automation will find the entire book to be of interest and value.

Price: $10.00

INTERNAL AUDITING AND ELECTRONIC DATA-PROCESSING MACHINES

Published by The Institute of Internal Auditors.

A preliminary report is made on the requirements for internal auditing in an electronic data processing system. Since there is little concrete information to go on as yet, the committee which prepared the report intends it "to provoke thought--rather than give answers."

However, the thinking of internal auditors is turning toward some points which are brought out in the report in the form of some questions.

How much technical knowledge should be necessary for the internal auditor? Should the internal auditor participate in the original programing for the machine? What control is required over source information? Should machine programing be tested in the internal

audit? What are the dangers of the making of changes or the introduction of extraneous data by the machine operator? What steps can be taken to determine the accuracy of data accumulated in machine storage units? What modifications in the internal auditing program may develop as electronic machine application increases?

Copies of the report may be purchased at 50¢ each from The Institute of Internal Auditors, 120 Wall Street, New York, New York.

Other articles of interest in this field, and similar in content: "A Valuable By-Product," by Roy E. Tuttle, University of Wisconsin; "Electronics and the Internal Auditor," by Virgil F. Blank, Haskins and Sells; both from THE INTERNAL AUDITOR, March 1957.

(See also: DPD, April 1957, page 1--"The Auditor Encounters Electronic Data Processing")

SIX TYPES OF FIRM—AND THE MANAGEMENT DATA THEY NEED

BUSINESS, January 1957; pages 84, 87, 89, 91.

The British Institute of Management and the Association of Incorporated Statisticians recently set up a joint management statistics committee which has been examining two questions:

"What information is really needed by the general management of firms of different types and sizes, and operating in different industries, if they are to ensure effective balance and co-ordination between the activities of their company as a whole--and particularly between sales and production?

"Can different companies be regarded as sufficiently 'similar' to justify the interchange of information on the general management statistics required for the purpose of co-ordinating these activities?

Type of firm decides data needs

"An analysis of data supplied by 43 manufacturing firms suggested that conventional methods of classifying companies by size, industry, etc., did not produce groupings within which 'co-ordination information' could usefully be exchanged. But it was found that suitable groups could be established by classifying companies according to the different policies they adopted in achieving such co-ordination."

The article lists the six types of firm and describes the common characteristics of those organizations falling into each category. Then, for each type a description is given of the type of information needed for long-term forecasts, short-term planning, and for current information needs. The six types are: long-term quantity producers, stock-level producers, products produced to customer's order and offered on a catalog basis, large quantities of items produced

to customers' orders and specifications, contract manufacturers of capital goods, and general or jobbing manufacturers.

For information about the study and about acquiring a copy of the article, write to: Advertising and Public Relations Department, Business Publications Ltd., Mercury House, 109-119 Waterloo Road, London S. E. 1, England.

DECENTRALIZED BUSINESS MACHINES

Floyd G. Steele, Litton Industries, La Jolla, California
Paper presented at Institute of Management Sciences, 1956.

It is suggested that business, industry, and in fact, society, is actually made up of layers of control systems, and that the integration of these systems is hampered by the concept of the large central data processing system. This thesis is based on the following conclusions:

Business control systems require parallel data inputs

1. "Automatic business management is a branch of automatic control.

2. "In the future, management science will be concerned with the designing of control systems of extraordinary elaboration.

3. "The design of business control and machine control systems have common principles.

4. "The area of machine control is already engaged in the first round of organizing elaborate automatic systems.

5. "In the field of machine control the correct choice of basic processes has a very substantial bearing upon final complexity, indeed upon the useful complexity which can be reached before equipment becomes saturated."

"The first step to machine and process simplification is to eliminate both random access and sorting requirements from business problems."

Sorting is eliminated by putting away the data as it comes into the system. Random access is eliminated by planning more realistic access cycles (for example, minimum access for a mail order house is the time between two mails).

"The economics of performing data handling by a number

of small decentralized machines is in the long run determined by the consideration that the successful incorporation of these first levels of automation, arising in both the factory and data handling areas, into higher levels of complexity can only be accomplished satisfactorily if this first structure consists of many parallel control processes, rather than a single, serial, multiplied one. Otherwise a saturation in equipment complexity will occur long before the required automatic business system is in sight--a situation already discovered in automatic control."

A copy of the paper may be obtained from the author.

THE COMPUTER IN COMMERCIAL DATA PROCESSING

E. G. Benser, C.I.T. Financial Corp.
SYSTEMS AND PROCEDURES, February 1957, pages 30-35, 37.

The philosophy behind the C.I.T. Financial Corporation computer application is summed up in the final paragraph of this article:

"Use what is available on the market as quickly as possible and you will be in a position to change over and improve as rapidly as new devices become available."

This organization made cost reduction the primary consideration in a changeover to electronic methods. The author gives seven points to be considered in the development of an electronic system:

1. Is a competent systems staff available? 2. What will the study cost--and are you prepared to invest the money? 3. Is management prepared to accept a new concept in record keeping? 4. What will the new system accomplish? 5. On what basis will the hardware be selected? 6. What are the installation problems? 7. In what form will permanent company records be maintained under the new system?

Each of these points is considered in the context of C.I.T.'s own experience.

ELECTRONICS IN THE OFFICE

Reprint from BUSINESS, November 1956.

A progress report on the status of electronic data processing in England, it expresses the opinion that British firms are reluctant

to experiment with the new equipment, and to throw over the old ways and redesign traditional business systems to use the capabilities of the new equipment. "Generally it is agreed that too much emphasis has been placed on the automatic preparation of payrolls. For on jobs like this a computer cannot really improve on the results obtained with conventional equipment--it can only produce them faster and cheaper." The report adds that "more exciting is the prospect of doing things which cannot be done satisfactorily at present...new and more precise methods of production planning and control, and of everything which is implied by the generic term 'Management accounting'....also, closer co-ordination between market research, market intelligence and manufacturing operations." A run-down on new or presently available equipment is given. Reprints may be obtained from the publisher (see listing under REFERENCES, page 16).

AUTOMATION OF BANK-CHECK ACCOUNTING

David Rubinfien, Arthur Young & Co., Chicago
THE JOURNAL OF ACCOUNTANCY, March 1957; pages 41-47.

The report of the American Bankers Association issued in July 1956 on "Magnetic Ink Character Recognition" is discussed in this article. A brief evaluation is given of ERMA, including the disadvantages of a special-purpose machine of the ERMA type. These disadvantages "hinge on the fact that banks perform a variety of functions other than check collection....general-purpose computers might find application to trust, stock transfer, loan and mortgage, and other operations for relatively little cost beyond that involved in check handling. While the use of common equipment by different departments has not been characteristic of banking operations in the past, many bankers believe that such an approach is a necessary one with electronics and that it holds significant promise for the future."

Other systems described are Burroughs' Sensitronic, Bank-o-Matic, and BEAM systems; IBM 650 and RAMAC; UNIVAC File Computer; NCR Postronic; Scandex by Farrington; International Telemeter; DIANE (Laboratory for Electronics); Standard Register's Stanomatic; and Teleregister.

PROCEEDINGS, SECOND ANNUAL ELECTRONIC BUSINESS SYSTEMS CONFERENCE

Western Division, N.M.A.A., 1956.

The eleven papers presented at the conference in November, 1956, have been published, and are available for purchase. The papers covered a wide range of subjects within the business data processing field. The proceedings may be ordered at $4.50 per copy from E.B.S. Conference, Box 3198 Rincon Annex, San Francisco, California.

Applications

A SMALL BANK STARTS ELECTRONIC CHECK POSTING

BANKING, February 1957; pages 42-44.

SIMPLER STATEMENTS AND SERVICE CHARGES THROUGH AUTOMATION

BANKING, March 1957; pages 60, 61, 96.

The Sheridan, Oregon branch of The United States National Bank of Portland did not wait for the computer industry to design a system to fit its needs. It looked around for existing methods and came up with a solution to its check processing problems. John N. Raleigh, Vice President of The United States National Bank worked with the branch manager on the problem.

Service bureau posts check transactions, prints out work sheet for branch

A Systematics linking device (see DPD: February 1956, page 9) connects the adding machine used for the proof operation with a keypunch. This is located at the main bank. An IBM 650 at a nearby service bureau is used during the night shift. The day's checks from the branch are proved at the main bank, and a card is punched automatically by the keypunch (via the Systematics link) for each transaction. These punch cards are the work cards, and are sorted mechanically by account number. The checks remain unsorted. At the service bureau, the work cards are loaded into the 650, forming a table in the computer memory. The file of the branch's accounts are on punch cards, four to a card. Now these cards are fed to the computer, and the table look-up searches for the transaction, if any, to match the account. This is an inversion of the usual procedure, in that ordinarily the transactions are posted to the file. This method saves computer storage space as well as look-up time.

As each transaction is processed, a new balance card is punched. The balance cards (including the updated ones) are then printed out on sheets and the sheets are returned to the branch along with the unsorted checks for the next day's operation. The branch never has a file of balance cards. It works from the print-out sheet produced from the balance cards at the main bank. When the checks are returned to the branch the next morning, most of the personnel turn to the task of sorting the checks. Mr. Raleigh anticipates this task will be done electronically within the next three years.

The customer's statement has changed, also. It was found that the detailed statements formerly used were costly, and probably unnecessary. A simple statement has been designed, and found to be acceptable by the customers, which shows only these items: Account number, period ending, number of items, service charge, beginning balance, ending balance. These figures are printed across the top of

the statement.

The bank feels that SONIA (System of Numeric Integrated Accounting) is well within the reach of most banks. They estimate that 20, 000 accounts is the break-even point if no other work is done on the computer. If the bank cannot have its own computer, a service bureau or shared time with a near-by industrial organization are alternatives.

((Part of the above information has been obtained through correspondence with Mr. John N. Raleigh.))

CASE STUDY OF THE ELECTRONIC-COMPUTER SYSTEM AT FARMERS INSURANCE GROUP

Paul Kircher, Management Sciences Research Project, University of California, Los Angeles.

A detailed report is given on the experience of the Farmers Insurance Group in installing their IBM 705 computer. The study covers initial selection of equipment and personnel, preparation of programs, installation, and actual operation. The report is of interest because of the relatively low cost of the installation, and the speed with which the conversion was made, through the conversion of punched card procedures to EDP.

A chronological description of the installation is given, including the management planning, the programing procedures, choice of personnel and equipment, program testing, installation and housing requirements, changeover, facts and figures on performance and savings, and planning for the needs of the public accountants.

To obtain a copy of the paper, write to Management Sciences Research Project, University of California, Los Angeles, California. Ask for Report No. 52.

COMPUTER AND SMALLER CHAIN GET TOGETHER

Abe L. Marks, Hartfield Stores, New York
CHAIN STORE AGE, March 1957; pages 26-28.

Hartfield Stores is a 39-store apparel chain doing $20, 000, 000 a year. It is using a medium-size computer (2000-word drum storage) to process inventories, shipments, sales, transfers into cumulative sales and closing inventories. Punched cards are produced from print-punch ticket garment tags. The Hartfield Stores application grew out of the need to update seven million individual inventories. Unit control records have been retained in the new system but now they are maintained automatically.

GOING INTO A COMPUTER PROGRAM

CHAIN STORE AGE, April 1957; pages 28, 41, 42, 44.

Sears Roebuck has been using an ElectroData computer for over six months, primarily in preparation of semi-annual sales and inventory budgets for the 725 retail stores. In addition, the computer is being used for sales snalysis, payroll, and analysis of response to Sears' catalogs. Applications being prepared for the machine are timekeeping, hosiery inventory control, and merchandise condition reports. Under consideration is an application by which Sears' orders and customer mail orders would be processed electronically in the eleven mail order plants in the U.S.

Sears will use computer for many merchandising problems

During the planning period, Sears had the benefit of its Allstate Insurance subsidiary's experience. The company purchased the medium size computer because it could be amortized quickly and it was susceptible to building-block enlargement as the company's needs grew. They foresee cost recovery within about four years, based on the budget application alone.

The company does not expect the electronic system to reduce the personnel. Not only does the installation need people to program and operate the equipment, and compile and interpret the results, but "much of [the] computing effort will probably be in areas never before explored, because of cost or manpower shortages. Hence, electronic data processing may, in fact, create new jobs, rather than eliminate old ones."

The computing room staff includes one supervisor and seven assistants, including one mathematician and two electronic engineers hired from outside the company. The other five are Sears employees transferred from other jobs. The company believes "the electronic computer offers a definite possibility for chains much smaller than Sears." If there are enough branches that it would require at least six people to manually process the data, a survey of computer possibilities would be in order.

ELECTRONIC YARDSTICK

FORBES, March 15, 1957; pages 29, 30.

Standard & Poor, in cooperation with Melpar, Inc., are using the latter's Datatron computer to compute an hourly average of 500 stocks which represent 90% of the value of the Big Board stocks. The computer edits the New York Stock exchange tape, disregarding all quotations except the 500, and averaging their value expressed in terms of a 1941-43 base of 10. The process takes less than one minute. The results have shown a more accurate picture of the market than the Dow-Jones Industrial Average.

CONTROLLING UNITS AT POINT-OF-SALE

CHAIN STORE AGE, April 1957; pages 22, 23.

After two years of operating its point-of-sale recorders and processing the data by means of punch card machines, J. W. Robinson has found some valuable results in its ready-to-wear operation: 1) Wage costs have been reduced by streamlining auditing procedures, and through a rise in sales productivity. This rise resulted from the additional time the clerk has for selling, since the sales record process has been cut in half. 2) A complete analysis of sales enables the buyer to have a daily unit control report each morning, and gives buyers, merchandise men and department managers a tool for getting maximum salability out of each item stocked. 3) The point-of-sale record shows accurate figures on taxes, fees and special charges which were formerly lumped together on the register and factored out on historical percentages.

Equipment

HIGH SPEED PRINTER-PLOTTER

JOURNAL of The Franklin Institute, March 1957; pages 278, 279.

Burroughs Corporation has designed and built for the Ballistics Research Laboratories a general purpose data recording "readout" device believed to be the first to match the speed of a computer. "BEPOC" uses a three-stage operation to produce its printed record. "Characters, plotting positions and alphameric information first take the form of a pinpoint pattern of electrostatic charges on the surface of low-cost paper as they come from the computer.

"Next, the pattern is made visible by passing the paper through a dry ink bath. Tiny amounts of the ink cling to the electrically charged pinpoint areas. The paper then rolls across a temperature controlled hot plate that 'fixes' the ink permanently, making it fade proof and smudge proof.

"The pinpoint pattern is made by passing short bursts of electric current through selected wires in a small matrix. Selection of the proper wires forms successive character or numerals. Each image is formed on the paper in three-millionths of a second."

Comment

THE SHARED PROGRAMING GROUPS

Only those who have had to program for a large computer installation can appreciate the mountainous size of the task. Preventive maintenance test checks must be provided. Housekeeping routines are a necessary chore. And most problems are made up of hundreds of small sequences which are used repeatedly but which must be reprogramed for each problem. The more a programer programs, the more he realizes how much of his work is sheer clerical drudgery. Inevitably, the programer comes to the day when he feels he (or his company) is hacking a path through the jungle, alone.

Fortunately, the time has come when the machetes may be discarded. The jungle is being cleared, not by individual program departments feeling their way through the tangled gloom, but by groups of users of specific equipment, dedicated to cooperative efforts to make the best use of programing techniques and to make them available to all.

PACT was first

The first of these "shared programing" groups was begun in November 1954 in the Los Angeles area when men from North American Aviation, Ramo-Wooldridge, Douglas, IBM, and RAND Corporation began work on PACT I. This was a programing and compiling routine for IBM 701, now being expanded under PACT I-A for the IBM 704. The cooperative spirit and flexible organization which evolved from the PACT group also characterize the groups which have developed since then.

SHARE was organized in August 1955 for IBM 704 users. It has grown international, having representatives in Canada, France, and England, besides the United States. This group was originated in Southern California, and in fact, grew out of the leadership in PACT.

The following December, users of the Univac 1103A organized a cooperative organization which they called USE (Univac Scientific Exchange).

A year later, December 1956, SHARE had spawned another group, this time for those who had, or would have an IBM 705. This group is called GUIDE.

Simultaneous with the development of GUIDE is DUO, Datatron Users Organization.

All of these organizations are working toward similar goals. They are attempting to standardize where possible, provide communications links among themselves and with the manufacturers, specify a common language which may be used for programs understandable to all who are using their respective machine types, and find automatic programing techniques which are acceptable and usable by all installations of the machine type.

SHARE, for example, has been working on standardization of assembly programs, mnemonic codes, and card format. The group has distributed standard programs to 704 users, and has made specific suggestions to IBM for design improvements which are being incorporated in future models. Another important job undertaken by SHARE is the education of 704 personnel.

Standardization, communication are aims

Characteristic of all the groups is the desire to talk through their programing problems until a solution is reached which is agreeable to all. Participating organizations usually designate two people to work on the shared programing project, one who can make policy decisions, and one who is thoroughly familiar with the organization's own programing problems and techniques. So far, distance has been the one deterrent to the efficiency of the groups. Meetings are held every three or four months in various parts of the country. Interest in the sharing principle has spread to other organizations. Recently, a conference of highway engineers subscribed to the sharing idea, and the Bureau of Public Roads was designated as the coordinating body.

CORRECTION

In the November 1956 issue of DPD, page 15, the following statement appears:

> "Because of the decree against IBM, maintenance contracts in the future will be separate from equipment rental contracts."

This statement is not correct. IBM's rental customers are provided maintenance under the standard service agreement contract as in the past. To our knowledge, all manufacturers who lease equipment include as an integral part of the lease agreement the maintenance of equipment and usually the necessary replacement parts.

References

The addresses of publishers and periodicals mentioned in this issue of Data Processing Digest are listed below for your convenience in obtaining further information about the articles or books listed.

American Management Association
1515 Broadway, Times Square
New York 36, New York

Armed Forces Management
208 South Second Street
Rockford, Illinois

Banking
12 East 36th Street
New York 16, New York

Business
Mercury House
109-119 Waterloo Road
London SE1, England

Chain Store Age
2 Park Avenue
New York 16, New York

Forbes
80 Fifth Avenue
New York 11, New York

Harvard University
Graduate School of Bus. Ad.
Cambridge, Massachusetts

Institute of Internal Auditors
(Internal Auditor)
120 Wall Street
New York 5, New York

Journal of Accountancy
270 Madison Avenue
New York 16, New York

Journal of the Franklin Institute
20th and the Parkway
Philadelphia 3, Pennsylvania

Systems and Procedures Quarterly
Box 281 Wall Street Station
New York, New York

John Wiley & Sons, Inc.
440 Fourth Avenue
New York 16, New York

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Meetings

The Association for Computing Machinery, Twelfth Annual Meeting

Date: June 19-21, 1957
Place: University of Houston, Houston, Texas
Submit abstracts to: J. E. Robertson, Chairman
ACM Program Committee
University of Illinois
Urbana, Illinois

NMAA 6th Annual Conference and Business Show

Date: June 26-28, 1957
Place: Chicago (Conrad Hilton Hotel)
Information: NMAA Conference, P. O. Box 1620, Chicago 90, Ill.

WESCON Show

Date: August 20-23, 1957
Place: San Francisco
Information: WESCON, 342 North La Brea, Los Angeles 36, California

Computers and Data Processing, 4th Annual Symposium sponsored by University of Denver

Date: August 29, 30, 1957
Place: Denver Research Institute (University of Denver)
Information: Professor Hedberg, University of Denver, Denver 10, Colo.

International Conference on Operational Research, sponsored by Operational Research Society, Operations Research Society of America, The Institute of Management Sciences.

Date: September 2-6, 1957
Place: University of Oxford, England
Subjects: The common themes in operational research, methodology, applications

Conference on Matrix Computations

Date: September 3-6, 1957
Place: Department of Mathematics, Wayne State University
Information: Professor Wallace Givens, Chairman,
Department of Mathematics, Wayne State University,
Detroit 2, Michigan

International Systems Meeting

Date: October 7-9, 1957
Place: Los Angeles, Calif. (Statler Hotel)
Information: Leslie Matthies, 1957 International Systems Meeting, 629 South Hill Street, Los Angeles 14, California

1957 Guided Missile Reliability Symposium

Date: November 5-7, 1957
Place: Naval Air Missile Test Center, Point Mugu, Calif.
Attendance: Limited to 500
Deadline for submitting abstracts: June 15, 1957

National Machine Accountants Association Western Division
Third Electronics Business Systems Conference

Date: November 7, 8, 1957
Place: San Diego, Calif. (U.S. Grant Hotel)
Information: G. M. Blakesley, Third Electronic Business Systems Conference, P.O. Box 1448, San Diego 12, California

Eastern Joint Computer Conference

Date: December 1957
Place: Washington, D. C.

Training

Summer Program, Wayne State University Computation Laboratory

Courses and Dates: June 3-8, Introduction to Computers and their Applications
June 10-15, Data Processing in Business and Industry
September 9-14, Industrial and Management Computer Applications
Information: A. W. Jacobson, Director, Computation Laboratory, Wayne State University, Detroit 2, Michigan

Short Course in Operations Research, Case Institute of Technology

Date: June 3-14, 1957
Place: Case Institute, Cleveland, Ohio
Registration: Enrollment is limited to 50
Information: W. W. Abendroth, Conference Director, Operations Research Group, Case Institute of Technology, Cleveland 6, Ohio

Operations Research--Advanced Techniques, Seminar #9146, sponsored by American Management Association

Date: June 5-7, 1957
Place: New York City (Sheraton-Astor Hotel
Level of knowledge required: a working knowledge of algebra, familiarity with statistical measurements, sampling concepts.
Information: Seminar Registrar, American Management Association, Inc. 1515 Broadway, Times Square, New York 36, N. Y.

Orientation Seminars on EDP and IDP, sponsored by AMA

Dates: June 17-19, 1957
Place: New York City (Sheraton-Astor Hotel)
Fee: $150 (AMA members) $175 (non members)
Information: American Management Association, 1515 Broadway, Times Square, New York 36, N. Y.

Wharton School Refresher Course on Work Simplification and Measurement

Date: June 17-28, 1957
Place: Wharton School, University of Pennsylvania, Philadelphia
For whom: Executive personnel, line and staff
Fee: $550.00, including living expenses
Information: Dr. A. M. McDonough, University of Pennsylvania, Wharton Refresher Conference, Philadelphia 4, Pa.

Seminars in operations research presented by Operations Research Institute

Date: One seminar each month through June, 1957
Subjects: Inventory and production management, Linear programing, Forecasting and budgeting.
Information: Operations Research Institute, Inc., 41 Fifth Avenue, New York 3, New York

Summer Session, 1957, University of Michigan--"Intensive Courses for Men in Engineering, Science, and Business"

Date: Courses begin June 17, 1957
Place: University of Michigan, Ann Arbor, Michigan

Courses in the Computer and Management Sciences:
(Others are offered in industrial subjects)

Introduction to Digital Computer Engineering
Advanced Digital Computer Engineering and Logical Design
Introduction to the Electronic Digital Computer and Its Applications
Applications of Advanced Numerical Analysis to Digital Computer Problems
Applications of Logic to Advanced Digital Computer Programing
Management Sciences

Dates: For above courses only, August 19-30
Fee: For each of above courses only, $200
Registration and Information: Co-ordinator of Engineering Summer Conferences, 2038 East Engineering Building, Ann Arbor, Michigan

Data Processing and Management Information, M.I.T. Summer Program

Date: July 15-19, 1957
Place: Massachusetts Institute of Technology, Cambridge, Mass.
Information: Professor James M. Austin, Director of the Summer Session, Room 7-101, M.I.T., Cambridge 39, Mass.

Electronic Data Processing for Business and Industry (sponsored by Canning, Sisson and Associates)

Date: July 22-26, 1957
Place: New York City (Hotel Roosevelt)
Fee: $160
Program: Emphasis on the applications aspect of electronic data processing
For whom: Controllers, Methods and Procedures Supervisors, others in management charged with setting up an EDP system
Information: Canning, Sisson and Associates, 1140 South Robertson Blvd., Los Angeles 35, California

School of Library Science, Western Reserve University Special Summer Seminars

Date: July 29-August 2, 1957
August 5-9, 1957
Place: Western Reserve University, Cleveland, Ohio
Fee: $2.00 per hour
Subjects: First week: Technical Libraries and Information Centers, Machine Aids to Librarianship, Documentation Survey, Report Writing. Second week: Theory of Classification, Operations Research and the Library, Machine Literature Searching, Technical Editing
Information: Jesse H. Shera, Dean, School of Library Science, Western Reserve University, 11161 East Boulevard, Cleveland 6, Ohio

AMA Summer Program--Office Management Division

Date: August 5-9, 1957
Place: Colgate University, Hamilton, New York
Information: Registrar, AMA Summer Program, American Management Association, 1515 Broadway, Times Square, New York 36, N.Y.

Graduate study courses at Illinois Institute of Technology

Course Titles: Automatic Computers for Business Systems I (B.E. 426)
Introduction to Digital Computing (Math 457)
Information: Director of Admissions, Illinois Institute of Technology, Chicago 16, Illinois

Master's Program in Automatic Data Processing, Wayne State University (School of Business Administration and the Computation Laboratory)

Information: Walter Folley, Dean, School of Business Administration, or A. W. Jacobson, Director, Computation Laboratory, Wayne State University, Detroit 2, Michigan